

§ Advanced Module Required
 ‡ STT® or Advanced Module Required

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 Δ Tandem Controller Required

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Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
All	All	GMAW CV	STD CV		5	Pinch	10 - 45 V
		GMAW Power	Power Mode®		40	Pinch	0.1 - 11 kW
Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
Steel	0.8 mm	GMAW CV	CV	CO ₂	93	Pinch	75 - 1200 ipm (1.91 - 30.48 m/min)
				Argon Mix	94		75 - 1200 ipm (1.91 - 30.48 m/min)
		GMAW Pulse	Pulse	Argon Mix	95	UltimArc®	65 - 1200 ipm (1.65 - 30.48 m/min)
			Precision Pulse™	Argon Mix	410		100 - 600 ipm (2.54 - 15.24 m/min)
	0.9 mm	GMAW CV	CV	CO ₂	138	Pinch	50 - 1200 ipm (1.27 - 30.48 m/min)
				Argon Mix	139		50 - 1075 ipm (1.27 - 27.31 m/min)
		GMAW Pulse	Pulse	Argon Mix	140	UltimArc®	60 - 1075 ipm (1.52 - 27.31 m/min)
			RapidArc®	Argon Mix	141		60 - 1200 ipm (1.52 - 30.48 m/min)
			Precision Pulse™	Argon Mix	411		100 - 600 ipm (2.54 - 15.24 m/min)
			Rapid X™(‡)	Argon Mix	272		75 - 800 ipm (1.91 - 20.32 m/min)
		GMAW STT®	Synergic STT®(‡)	CO ₂	324	UltimArc®, Hot Start	100 - 225 ipm (2.54 - 5.72 m/min)
				Argon Mix	325		100 - 225 ipm (2.54 - 5.72 m/min)
			NonSynergic STT®(‡)	CO ₂	304	Peak, Background, Tailout, Hot Start	100 - 300 ipm (2.54 - 7.62 m/min)
				Argon Mix	305		100 - 300 ipm (2.54 - 7.62 m/min)
		GMAW AC STT®	Synergic AC STT®(§)	CO ₂	380	Balance, UltimArc®	50 - 200 ipm (1.27 - 5.08 m/min)
				Argon Mix	381		50 - 200 ipm (1.27 - 5.08 m/min)
	1.0 mm	GMAW CV	CV	CO ₂	10	Pinch	50 - 775 ipm (1.27 - 19.69 m/min)
				Argon Mix	11		50 - 610 ipm (1.27 - 15.49 m/min)
		GMAW Pulse	Pulse	Argon Mix	12	UltimArc®	75 - 590 ipm (1.91 - 14.99 m/min)
			RapidArc®	Argon Mix	13		60 - 825 ipm (1.52 - 20.96 m/min)
			Precision Pulse™	Argon Mix	412		75 - 600 ipm (1.91 - 15.24 m/min)
			Rapid X™(‡)	Argon Mix	273		75 - 800 ipm (1.91 - 20.32 m/min)
		GMAW STT®	Synergic STT®(‡)	CO ₂	326	UltimArc®, Hot Start	90 - 225 ipm (2.29 - 5.72 m/min)
				Argon Mix	327		90 - 225 ipm (2.29 - 5.72 m/min)
			NonSynergic STT®(‡)	CO ₂	306	Peak, Background, Tailout, Hot Start	90 - 225 ipm (2.29 - 5.72 m/min)
				Argon Mix	307		90 - 225 ipm (2.29 - 5.72 m/min)
		GMAW AC STT®	Synergic AC STT®(§)	CO ₂	382	Balance, UltimArc®	45 - 185 ipm (1.14 - 4.7 m/min)
				Argon Mix	383		45 - 185 ipm (1.14 - 4.7 m/min)
	1.2 mm	GMAW CV	CV	CO ₂	20	Pinch	50 - 540 ipm (1.27 - 13.72 m/min)
				Argon Mix	21		50 - 440 ipm (1.27 - 11.18 m/min)
		GMAW Pulse	Pulse	Argon Mix	22	UltimArc®	60 - 475 ipm (1.52 - 12.07 m/min)
			RapidArc®	Argon Mix	18		60 - 605 ipm (1.52 - 15.37 m/min)
Precision Pulse™			Argon Mix	413	75 - 600 ipm (1.91 - 15.24 m/min)		
Rapid X™(‡)			Argon Mix	274	100 - 690 ipm (2.54 - 17.53 m/min)		
GMAW STT®		Synergic STT®(‡)	CO ₂	328	UltimArc®, Hot Start	90 - 200 ipm (2.29 - 5.08 m/min)	
			Argon Mix	329		90 - 200 ipm (2.29 - 5.08 m/min)	
		NonSynergic STT®(‡)	CO ₂	308	Peak, Background, Tailout, Hot Start	90 - 225 ipm (2.29 - 5.72 m/min)	
			Argon Mix	309		90 - 225 ipm (2.29 - 5.72 m/min)	
	GMAW AC STT®	Synergic AC STT®(§)	CO ₂	384	Balance, UltimArc®	40 - 170 ipm (1.02 - 4.32 m/min)	
			Argon Mix	385		40 - 170 ipm (1.02 - 4.32 m/min)	
1.4 mm	GMAW CV	CV	CO ₂	24	Pinch	50 - 310 ipm (1.27 - 7.87 m/min)	
			Argon Mix	25		50 - 290 ipm (1.27 - 7.37 m/min)	
	GMAW Pulse	Pulse	Argon Mix	26	UltimArc®	50 - 300 ipm (1.27 - 7.62 m/min)	
		RapidArc®	Argon Mix	27		60 - 335 ipm (1.52 - 8.51 m/min)	
		Rapid X™(‡)	Argon Mix	275	75 - 395 ipm (1.91 - 10.03 m/min)		
1.6 mm	GMAW CV	CV	Argon Mix	107	Pinch	50 - 225 ipm (1.27 - 5.72 m/min)	
	GMAW Pulse	Pulse	Argon Mix	108	UltimArc®	50 - 255 ipm (1.27 - 6.48 m/min)	
Metal Core	0.9mm	GMAW Rapid Z™	Rapid Z™(§)	Argon Mix	472	UltimArc®	75 - 900 ipm (1.91 - 22.86 m/min)
	1.0mm	GMAW Rapid Z™	Rapid Z™(§)	Argon Mix	473	UltimArc®	70 - 700 ipm (1.78 - 17.78 m/min)
	1.2 mm	GMAW CV	CV	Argon Mix	81	Pinch	50 - 555 ipm (1.27 - 14.1 m/min)
			Pulse	Argon Mix	82	UltimArc®	50 - 530 ipm (1.27 - 13.46 m/min)
			Rapid X™(‡)	Argon Mix	294		75 - 700 ipm (1.91 - 17.78 m/min)
	1.4 mm	GMAW Pulse	Pulse	Argon Mix	84	UltimArc®	50 - 335 ipm (1.27 - 8.51 m/min)
			Rapid X™(‡)	Argon Mix	295		60 - 420 ipm (1.52 - 10.67 m/min)
	1.6 mm	GMAW CV	CV	Argon Mix	85	Pinch	50 - 310 ipm (1.27 - 7.87 m/min)
Pulse			Argon Mix	86	UltimArc®	50 - 360 ipm (1.27 - 9.14 m/min)	
		Rapid X™(‡)	Argon Mix	296		75 - 360 ipm (1.91 - 9.14 m/min)	
Stainless Metal Core EC4XX	1.2 mm	GMAW Pulse	Rapid X™(‡)	Argon Mix	290	UltimArc®	75 - 665 ipm (1.91 - 16.89 m/min)

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	GMAW		Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	Stainless	0.8 mm	GMAW CV	CV	Argon Mix	61	Pinch	100 - 1120	ipm	(2.54 - 28.45 m/min)
Ar He CO ₂								63	100 - 1200	ipm
GMAW Pulse			Pulse	Ar He CO ₂	64	UltimArc®	100 - 1200	ipm	(2.54 - 30.48 m/min)	
							Argon Mix	66	100 - 1200	ipm
0.9 mm			GMAW CV	CV	Argon Mix	29	Pinch	75 - 1200	ipm	(1.91 - 30.48 m/min)
								Ar He CO ₂	30	60 - 1110
			GMAW Pulse	Pulse	Argon Mix	30	UltimArc®	60 - 1110	ipm	(1.52 - 28.19 m/min)
								Argon Mix	421	100 - 600
			GMAW STT®	Synergic STT®(‡)	Ar He CO ₂	364	UltimArc®, Hot Start	100 - 300	ipm	(2.54 - 7.62 m/min)
								Argon Mix	365	100 - 250
GMAW STT®			NonSynergic STT®(‡)	Ar He CO ₂	344	Peak, Background, Tailout, Hot Start	100 - 300	ipm	(2.54 - 7.62 m/min)	
							Ar He CO ₂	345	100 - 300	ipm
1.0 mm		GMAW CV	CV	Argon Mix	31	Pinch	75 - 920	ipm	(1.91 - 23.37 m/min)	
							Ar He CO ₂	33	75 - 710	ipm
		GMAW Pulse	Pulse	Ar He CO ₂	34	UltimArc®	60 - 835	ipm	(1.52 - 21.21 m/min)	
							Argon Mix	36	60 - 910	ipm
		GMAW Pulse	Precision Pulse™	Argon Mix	422	UltimArc®	60 - 600	ipm	(1.52 - 15.24 m/min)	
							Argon Mix	283	100 - 800	ipm
		GMAW STT®	Synergic STT®(‡)	Ar He CO ₂	366	UltimArc®, Hot Start	100 - 300	ipm	(2.54 - 7.62 m/min)	
							Argon Mix	367	100 - 250	ipm
	GMAW STT®	NonSynergic STT®(‡)	Ar He CO ₂	346	Peak, Background, Tailout, Hot Start	100 - 300	ipm	(2.54 - 7.62 m/min)		
						Ar He CO ₂	347	100 - 300	ipm	(2.54 - 7.62 m/min)
	1.2 mm	GMAW CV	CV	Argon Mix	41	Pinch	75 - 460	ipm	(1.91 - 11.68 m/min)	
							Ar He CO ₂	43	75 - 435	ipm
GMAW Pulse		Pulse	Ar He CO ₂	44	UltimArc®	50 - 450	ipm	(1.27 - 11.43 m/min)		
						Argon Mix	46	50 - 560	ipm	(1.27 - 14.22 m/min)
GMAW Pulse		Precision Pulse™	Argon Mix	423	UltimArc®	50 - 400	ipm	(1.27 - 10.16 m/min)		
						Argon Mix	284	100 - 780	ipm	(2.54 - 19.81 m/min)
GMAW STT®	Synergic STT®(‡)	Ar He CO ₂	368	UltimArc®, Hot Start	90 - 200	ipm	(2.29 - 5.08 m/min)			
					Argon Mix	369	90 - 200	ipm	(2.29 - 5.08 m/min)	
GMAW STT®	NonSynergic STT®(‡)	Ar He CO ₂	348	Peak, Background, Tailout, Hot Start	90 - 225	ipm	(2.29 - 5.72 m/min)			
					Ar He CO ₂	349	90 - 225	ipm	(2.29 - 5.72 m/min)	
1.6 mm	GMAW CV	CV	Argon Mix	51	Pinch	50 - 215	ipm	(1.27 - 5.46 m/min)		
						Ar He CO ₂	56	50 - 235	ipm	(1.27 - 5.97 m/min)
SIBr	1.0mm	GMAW Pulse	Pulse	Argon	192	UltimArc®	80 - 775	ipm	(2.03 - 19.69 m/min)	
							1.2mm	GMAW Pulse	Pulse	Argon
Cu	1.0mm	GMAW Pulse	Pulse	Argon Helium	198	UltimArc®	75 - 500	ipm	(1.91 - 12.7 m/min)	
							1.2mm	GMAW Pulse	Pulse	Argon Helium
NiCr	1.0mm	GMAW Pulse	Pulse	Ar/ Ar He	502	UltimArc®	75 - 800	ipm	(1.91 - 20.32 m/min)	
							1.2mm	GMAW Pulse	Pulse	Ar/ Ar He
Aluminum (AISI)	1.0 mm	GMAW CV	CV	Argon	148	Pinch	125 - 800	ipm	(3.18 - 20.32 m/min)	
							Argon	149	125 - 800	ipm
		GMAW Pulse	Pulse	Argon	150	UltimArc®	125 - 800	ipm	(3.18 - 20.32 m/min)	
							Argon	150	125 - 800	ipm
		GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	98	Frequency	100 - 500	ipm	(2.54 - 12.7 m/min)	
							Argon	392	125 - 700	ipm
		GMAW AC Pulse	AC Pulse (\$)	Argon	392	UltimArc®	125 - 700	ipm	(3.18 - 17.78 m/min)	
							Argon	392	125 - 700	ipm
	1.2 mm	GMAW CV	CV	Argon	71	Pinch	125 - 590	ipm	(3.18 - 14.99 m/min)	
							Argon	72	85 - 600	ipm
		GMAW Pulse	Pulse	Argon	72	UltimArc®	85 - 600	ipm	(2.16 - 15.24 m/min)	
							Argon	69	85 - 600	ipm
	GMAW Pulse on Pulse®	Pulse on Pulse®	Argon	99	Frequency	85 - 500	ipm	(2.16 - 12.7 m/min)		
						Argon	393	100 - 500	ipm	(2.54 - 12.7 m/min)
	GMAW AC Pulse	AC Pulse (\$)	Argon	393	UltimArc®	100 - 500	ipm	(2.54 - 12.7 m/min)		
						Argon	393	100 - 500	ipm	(2.54 - 12.7 m/min)
	1.6 mm	GMAW CV	CV	Argon	73	Pinch	75 - 340	ipm	(1.91 - 8.64 m/min)	
							Argon	74	75 - 350	ipm
		GMAW Pulse	Pulse	Argon	74	UltimArc®	75 - 350	ipm	(1.91 - 8.89 m/min)	
							Argon	79	75 - 350	ipm
GMAW Pulse on Pulse®		Pulse on Pulse®	Argon	100	Frequency	80 - 400	ipm	(2.03 - 10.16 m/min)		
						Argon	394	100 - 400	ipm	(2.54 - 10.16 m/min)
GMAW AC Pulse	AC Pulse (\$)	Argon	394	UltimArc®	100 - 400	ipm	(2.54 - 10.16 m/min)			
					Argon	394	100 - 400	ipm	(2.54 - 10.16 m/min)	

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GMAW	Aluminum (AlMg)	Size	Procedure		Gas Type	Mode #	Arc Control	Max. Range (*)
			Waveform	Waveform				
GMAW	1.0 mm	1.0 mm	GMAW CV	CV	Argon	151	Pinch	175 - 750 ipm (4.45 - 19.05 m/min)
			GMAW Pulse	Pulse	Argon	152	UltimArc®	125 - 700 ipm (3.18 - 17.78 m/min)
			GMAW Pulse	CC Pulse	Argon	153	UltimArc®	125 - 700 ipm (3.18 - 17.78 m/min)
			GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	101	Frequency	140 - 800 ipm (3.56 - 20.32 m/min)
	1.2 mm	1.2 mm	GMAW AC Pulse	AC Pulse (§)	Argon	397	UltimArc®	100 - 800 ipm (2.54 - 20.32 m/min)
			GMAW CV	CV	Argon	75	Pinch	125 - 750 ipm (3.18 - 19.05 m/min)
			GMAW Pulse	Pulse	Argon	76	UltimArc®	85 - 700 ipm (2.16 - 17.78 m/min)
			GMAW Pulse	CC Pulse	Argon	70	UltimArc®	85 - 700 ipm (2.16 - 17.78 m/min)
	1.6 mm	1.6 mm	GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	102	Frequency	100 - 600 ipm (2.54 - 15.24 m/min)
			GMAW AC Pulse	AC Pulse (§)	Argon	398	UltimArc®	85 - 600 ipm (2.16 - 15.24 m/min)
			GMAW CV	CV	Argon	77	Pinch	125 - 470 ipm (3.18 - 11.94 m/min)
			GMAW Pulse	Pulse	Argon	78	UltimArc®	100 - 460 ipm (2.54 - 11.68 m/min)
1.6 mm	1.6 mm	GMAW Pulse	CC Pulse	Argon	80	UltimArc®	100 - 450 ipm (2.54 - 11.43 m/min)	
		GMAW Pulse on Pulse*	Pulse on Pulse*	Argon	103	Frequency	75 - 350 ipm (1.91 - 8.89 m/min)	
		GMAW AC Pulse	AC Pulse (§)	Argon	399	UltimArc®	100 - 400 ipm (2.54 - 10.16 m/min)	

FCAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
	Flux Core								
FCAW	Flux Core	All	FCAW-S	Self Shield CV	NA	6	Pinch	10 - 45 V	
			FCAW-G	Gas Shield CV	NA	7	Pinch	10 - 45 V	
	Cored Wire	1.2 mm	1.2 mm	FCAW-G	CV	CO ₂	90	Pinch	175 - 600 ipm (4.45 - 15.24 m/min)
									Argon Mix
		1.4 mm	1.4 mm	FCAW-G	CV	CO ₂	187	Pinch	150 - 500 ipm (3.81 - 12.7 m/min)
									Argon Mix
		1.6 mm	1.6 mm	FCAW-G	CV	CO ₂	189	Pinch	125 - 390 ipm (3.18 - 9.91 m/min)
									Argon Mix

SMAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)	
	NA								
SMAW	NA	NA	DCEP SMAW	SMAW Soft	NA	1	Arc Force, Hot Start	15 - 350 A	
				SMAW Crisp	NA	2	Arc Force, Hot Start	15 - 350 A	
				SMAW Pipe	NA	4	Arc Force	50 - 250 A	
				DCEN SMAW	SMAW DC- (§)	NA	379	Arc Force, Hot Start	15 - 350 A
				AC SMAW	AC SMAW (§)	NA	374	Arc Force, Hot Start, Frequency	15 - 350 A

GTAW	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)		
	NA									
GTAW	NA	NA	DCEN GTAW	Touch Start TIG	Ar / He	3	Hot Start	5 - 350 A		
				Touch Start TIG Pulse	Ar / He	8	Frequency, Background, Hot Start	5 - 350 A		
				HF TIG (Θ)	Ar / He	375	Hot Start	5 - 350 A		
				HF TIG Pulse (Θ)	Ar / He	376	Frequency, Background, Hot Start	5 - 350 A		
			AC GTAW	AC GTAW	NA	Touch Start AC TIG (§)	Ar / He	377	AC Frequency, AC Balance, DC Offset, Hot Start	10 - 350 A
						HF Start AC TIG (§)	Ar / He	378	AC Frequency, AC Balance, DC Offset, Hot Start	10 - 350 A

CAG	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	NA							
CAG	NA	NA	CAG	Arc Gouge	Compressed Air	9		60 - 350 A

GMAW-Tandem	Type	Size	Procedure	Waveform	Gas Type	Mode #	Arc Control	Max. Range (*)
	Steel							
GMAW-Tandem	1.0 mm	1.0 mm	GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	402	UltimArc®, Phase Angle	150 - 800 ipm (3.81 - 20.32 m/min)
				Sync Pulse Trail	Argon Mix	403	UltimArc®	150 - 800 ipm (3.81 - 20.32 m/min)
				HotWire Pulse Trail	Argon Mix	461		80 - 800 ipm (2.03 - 20.32 m/min)
				Sync Pulse Lead	Argon Mix	404	UltimArc®, Phase Angle	100 - 655 ipm (2.54 - 16.64 m/min)
				Sync Pulse Trail	Argon Mix	405	UltimArc®	100 - 655 ipm (2.54 - 16.64 m/min)
				HotWire Pulse Trail	Argon Mix	462		75 - 610 ipm (1.91 - 15.49 m/min)
	1.2 mm	1.2 mm	GMAW Tandem (Δ)	Sync Pulse Lead	Argon Mix	406	UltimArc®, Phase Angle	100 - 455 ipm (2.54 - 11.56 m/min)
				Sync Pulse Trail	Argon Mix	407	UltimArc®	100 - 455 ipm (2.54 - 11.56 m/min)
				HotWire Pulse Trail	Argon Mix	463		50 - 445 ipm (1.27 - 11.3 m/min)